IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Mei Chen	Art Unit	: 2624
Serial No.	: 10/824,692	Examiner	: Smith, Jeffrey S
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Title	: ENHANCING IMAGE RESOLUTION		

Commissioner for Patents
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REPLY BRIEF

I. Introduction

Claims 1-55, which are the subject of this appeal, are pending.

The pending claims 1-55 stand rejected as follows:

A. Claims 1-3, 11, 16, 17, 28, 29, 32, 37, 42, 43, 46, and 51 stand rejected under 35 U.S.C. § 103(a) over Schultz ("Subpixel Motion Estimation for Super-Resolution Image Sequence Enhancement") in view of Paniconi (U.S. 7,088,773).

B. Claims 4, 5, and 44 stand rejected under 35 U.S.C. § 103(a) over Schultz ("Subpixel Motion Estimation for Super-Resolution Image Sequence Enhancement") in view of Paniconi (U.S. 7,088,773) and Hanna (U.S. 6,269,175).

C. Claims 6, 12-15, 31, 33-36, 45, and 47-50 stand rejected under 35 U.S.C. § 103(a) over Schultz ("Subpixel Motion Estimation for Super-Resolution Image Sequence Enhancement") in view of Paniconi (U.S. 7,088,773) and Eren ("Robust, Object-Based High-Resolution Image Reconstruction from Low-Resolution Video").

D. Claims 7-10, 18-27, 38-41, and 52-55 stand rejected under 35 U.S.C. § 103(a) over Schultz ("Subpixel Motion Estimation for Super-Resolution Image Sequence Enhancement") in view of Paniconi (U.S. 7,088,773),

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Eren ("Robust, Object-Based High-Resolution Image Reconstruction from Low-Resolution Video"), and Kondo (U.S. 6,307,560).

II. The Examiner's response to the Appeal Brief and Appellant's rebuttal

A. Rejection of claims 1-3, 11, 16, 17, 28, 29, 32, 37, 42, 43, 46, and 51 under 35 U.S.C. § 103(a)

1. Independent claim 1

a. Introduction

The rejection of claim 1 under 35 U.S.C. § 103(a) over Schultz in view of Paniconi should be withdrawn because Schultz and Paniconi, taken either alone or in any permissible combination, do not disclose or suggest all the limitations of the claimed invention. The rejection of claim 1 also should be withdrawn because at the time the invention was made there was no apparent reason to combine the teachings of Schultz and Paniconi in the fashion claimed.

b. The Examiner's response to Appellant's explanation that Schultz does not disclose or suggest the "assigning" element of claim 1

The Examiner has taken the position that Schultz discloses the "assigning" element of claim 1 in the abstract and sections 2-3 (see page 2, second from last line - page 3, end of first full ¶ of the final Office action).

In the Appeal Brief, Appellant explained that the cited sections of Schultz do not support the Examiner's position that Schultz discloses "assigning respective regions of a target image to motion classes based on the computed motion maps," as recited in claim 1 (see § VII.B.3.a.i on pages 11-13 of the Appeal Brief). The Examiner has replied to this explanation as follows (see page 5, last ¶ - page 6, second full ¶ of the Answer; emphasis added):

> Schultz discloses assigning respective regions of a target image to motion classes based on the computed motion maps, in section 3 entitled "SUBPIXEL MOTION ESTIMATION TECHNIQUES," which describes several methods of computing subpixel motion vectors for low resolution image pixels. For example, section 3.2 describes a block matching motion estimation process that creates a motion map for objects that move independently in image

> sequences, and assigns respective regions of the target image to motion vectors based on the computed motion maps by determining separate motion fields (or "motion classes") for compact blocks (or "respective regions") in the image sequences. See page 42, first column, "the motion field is uniform over compact blocks of pixels."
>
> In the claim language, the term "motion class" is broad enough to encompass a group of pixels that are assigned to a motion vector. As appellant noted on page 14 of his appeal brief, the "pertinent definition of 'class' is 'a group, set, or kind sharing common attributes.'"
>
> Clearly, Schultz discloses assigning respective regions of a target image to motion classes, where each motion field (or motion vector) of a compact block is a motion class assigned to a respective region, because the pixels in the region "share the common attribute" of motion associated with the motion vector. Thus, Schultz implicitly describes the concept of motion classes when discussing motion estimation, but Schultz does not explicitly use the phrase "motion classes." As discussed below, Paniconi explicitly discloses the term "motion class."

In this reply, however, the Examiner has relied on a factually incorrect interpretation of Schultz' disclosure in § 3.2. In particular, § 3.2 does not disclose that block matching motion estimation involves (i) computing a motion map and (ii) assigning respective regions of an image to motion vectors based on the computed motion maps, as asserted by the Examiner. Instead, as is well-known in the art, block matching motion estimation involves estimating a single motion vector that maps the pixels of a block of a first image to a matching block of a second image (see, e.g., § 3.2, second ¶ of Schultz). That is, the block matching motion estimation process described in § 3.2 only involves determining a motion map that contains motion vectors between matching blocks of a pair of images; it does not involve a separate step of assigning motion vectors to regions -- indeed, the motion map already contains a motion vector for each block.

This point was explained to the Examiner in the second full ¶ on page 12 of the Appeal Brief. The Examiner responded to this point as follows (see page 18, last ¶ of the Answer):

> The rest of appellant's arguments relating to the "assigning" element found in Schultz, found for example on pages 11 to 13 of the appeal brief, are discussing the actual language found in Schultz, and concluding that the actual language does not include

> the literal words "assigning respective regions of a target image to motion classes based on the computed motion maps, the target image having a target resolution level and the base images having a base resolution level equal to or lower than the target resolution level."
>
> However, the motion vectors of Schultz form a motion map. The motion vectors are assigned to specific regions in accordance with the motion map. The pixels that are assigned to the motion vectors form motion classes in a manner that is consistent with the plain meaning of the English word "class" and with the meaning of the word "class" given by appellant on page 14 footnote 2 of the brief. The base images have a resolution lower than the target image. These elements are clearly shown throughout the entire article by Schultz, beginning with the title "Subpixel Motion Estimation for Super-Resolution Image Sequence Enhancement" and ending with the conclusion, as discussed in the rejection and as further discussed by appellant's citations of Schultz.

In this reply, however, the Examiner again has missed Appellant's point that claim 1 recites both a "computing" element (i.e., "computing a respective motion map for each pairing of a reference image and a respective image neighboring the reference image in a sequence of base images") and an "assigning" element (i.e., "assigning respective regions of a target image to motion classes based on the computed motion maps"). The Examiner's position improperly conflates the "computing" element of claim 1 with the "assigning" element of claim 1 and, thereby, effectively reads the "assigning" element out of the claim. In particular, the motion map disclosed in Schultz consists of a set of motion vectors from the blocks of one image to matching blocks of another image (see, e.g., § 3.2 of Schultz). Thus, once computed, the motion map consists of motion vectors that are assigned to blocks; that is what a "motion map" means in accordance with the ordinary and accustomed meaning of the term. Schultz does not even hint that there is a separate step of assigning respective regions of a target image to motion classes based on the computed motion maps.

As explained in the first full ¶ on page 13 of the Appeal Brief, the Examiner's position that Schultz discloses the "assigning" element of claim 1 amounts to no more than an improper conflation of the "motion classes" elements of claim 1 with the "motion vectors" elements of claim 1. In particular, the Examiner's position relies on a single element of Schultz' disclosure

(i.e., the motion vectors of a motion map) to meet two separate and discrete elements recited in claim 1 (i.e., the "motion vectors" and the "motion classes"). In effect, the Examiner's rejection of claim 1 impermissibly relies on reading the "motion classes" element out of the claim. The Examiner did not address this point in his Answer.

c. The Examiner's response to Appellant's explanation that neither Schultz nor Paniconi discloses the "computing pixel values" element of claim 1

The Examiner has taken the position that Schultz discloses the "computing pixel values" element of claim 1 in sections 2 and 3 (see page 3, second full ¶ of the final Office action).

In the Appeal Brief, Appellant explained that the cited sections of Schultz do not support the Examiner's position that Schultz discloses "computing pixel values for the target image based on corresponding pixel value contributions from the base images selected in accordance with the motion classes assigned to the target image regions," as recited in claim 1 (see § VII.B.3.b.i on pages 14-15 of the Appeal Brief). In particular, the Examiner has taken the position that "...the super resolution images that are created by Schultz's method are created by pixel value contributions from other images selected in accordance with the motion estimates assigned to the target image regions as discussed at length by Schultz throughout sections 2 and 3. ..." (see the last ¶ on page 6 and the first full ¶ on page 20 of the Answer). As explained above, however, the motion estimates disclosed in Schultz do not constitute motion classes. Moreover, the Examiner's position in this regard improperly conflates the "motion classes" elements of claim 1 with the "motion vectors" elements of claim 1 and, thereby, effectively reads the "motion classes" elements out of the claim.

In the Appeal Brief, Appellant also explained that the cited sections of Paniconi do not support the Examiner's position that Paniconi discloses "computing pixel values for the target image based on corresponding pixel value contributions from the base images selected in accordance with the motion classes assigned to the target image regions," as recited in claim 1 (see § VII.B.3.b.ii on pages 15-16 of the Appeal Brief). The Examiner has replied to this explanation as follows (page 20, last full ¶ of the Answer; emphasis added):

> ... Paniconi in cols. 1 and 2 discusses using motion classes to generate pixel values for a target image based on corresponding

> pixel value contributions from base images selected in accordance with the motion classes, where the base images have a resolution equal to the target resolution level. This reads on claim 1, because claim 1 recites that the base images have a resolution "equal to" the target resolution level, therefore, the claim reads on a conventional compression method such as that disclosed by Paniconi.

Contrary to the Examiner's assumption, however, the video compression method disclosed in columns 1-2 of Paniconi does not involve "computing pixel values for the target image based on corresponding pixel value contributions from the base images." Instead, this video compression method involves coding a first frame as an entire image and coding a second image with motion vector references to blocks of the first image and the differences between the two frames (see col. 1, lines 11-27). During decompression, the pixel values of the second frame are not computed based on pixel value contributions from the first and second frames; instead, the pixel values of the second frame are computed based on the pixel values of the first frame and the difference values.

For the reasons explained above, neither Schultz nor Paniconi discloses or suggests the computing element of claim 1.

d. Thus, Schultz and Paniconi do not disclose or suggest each and every element of claim 1

As explained above and in the Appeal Brief, neither Schultz nor Paniconi discloses or suggests "computing pixel values for the target image based on corresponding pixel value contributions from the base images," as recited in claim 1. For at least this reason, the rejection of independent claim 1 under 35 U.S.C. § 103(a) over Schultz in view of Paniconi should be withdrawn.

e. The Examiner's response to Appellant's explanation that one skilled in the art at the time the invention was made would not have had any apparent reason to modify the teachings of Schultz in the manner proposed by the Examiner

In § VII.B.3.c on pages 16-18 of the Appeal Brief, Appellant explained that at the time the invention was made there was no apparent reason to combine the teachings of Schultz and Paniconi in the fashion claimed in claim 1. In particular, the Examiner has stated that "...it

would have been obvious to one of ordinary skill in the art to use the motion estimation that includes the motion classes of Paniconi when performing the motion estimation in the super resolution enhancement algorithm of Schultz, because each motion class can be tracked across frames using vectors, which saves processing time as taught by Paniconi col. 2 lines 45-49" (see first ¶ on page 8 of the Answer).

In the Appeal Brief, Appellant explained that, contrary to the Examiner's statement, one skilled in the art would not have had any apparent reason to include the motion classes of Paniconi with the super resolution enhancement algorithm of Schultz because neither Schultz nor Paniconi discloses or suggests how such a modification of Schultz' teachings would have served any useful purpose whatsoever. For example, although it is possible to classify the low-resolution video frames disclosed in Schultz using the motion classification process disclosed in Paniconi, neither Schultz nor Paniconi discloses or suggests how the results of such motion classification would serve any useful purpose in the context of Schultz' super-resolution image enhancement process. Moreover, neither Schultz nor Paniconi even hints at a way in which such motion classification results might be used in determining the pixel values of the high-resolution video still image.

Instead of pointing to some teaching or suggestion in Schultz, Paniconi, or the knowledge generally available to support the proposed combination of Schultz and Paniconi, the Examiner has relied on circular reasoning. In particular, the Examiner's proffered motivation (i.e., "because each motion class can be tracked across frames using vectors, which saves processing time as taught by Paniconi col. 2 lines 45-49"; see page 5, lines 5-7 of the final Office action) assumes the result (i.e., the modification of Schultz' system) to which the proffered "motivation" was supposed to have led one skilled in the art. Such circular reasoning cannot possibly support a rejection under 35 U.S.C. § 103(a). Indeed, such circular reasoning only evidences the fact that the Examiner improperly has engaged in impermissible hindsight reconstruction of the claimed invention, using applicants' disclosure as a blueprint for piecing together elements from the prior art in a manner that attempts to reconstruct the invention recited in claim 1 only with the benefit of impermissible hindsight (see KSR Int'l Co. v. Teleflex Inc., slip op. at 17: "A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon ex post reasoning."). The fact is that neither Schultz nor Paniconi nor the

knowledge generally available at the time the invention was made would have led one skilled in the art to believe that there was any problem to be solved or any advantage that would be gained by the Examiner's proposed modification of Schultz's system.

In the Answer, the Examiner responded to Appellant's explanation by arguing that "one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references" (page 21, first full ¶ of the Answer). However, Appellant's explanation that there was no apparent reason to combine the teachings of Schultz and Paniconi in the fashion claimed in claim 1 does not rely on "attacking references individually." Instead, this explanation shows that neither Schultz nor Paniconi discloses or suggests how the results of applying Paniconi's motion classification to Schultz method would serve any useful purpose in the context of Schultz' super-resolution image enhancement process and additionally shows that neither Schultz nor Paniconi provides even a glimmer of a way in which such motion classification results might be used in determining the pixel values of the high-resolution video still image.

The Examiner also responded to Appellant's explanation as follows (see last ¶ of page 23 - page 24, line 6, of the Answer):

> ... To be nonobvious, an improvement must be "more than the predictable use of prior art elements according to their established functions." Id. Here the combination is the predictable use of two known methods, one performed by the other, according to their established functions, to achieve their predictable results. In this case, Schultz discloses the known method of "computing pixel values for the target image based on corresponding pixel value contributions from the base images selected in accordance with motion [estimates] assigned to the target image regions" and Paniconi discloses the known method of motion estimation that creates "motion classes assigned to the target image regions." Therefore, the combination of "computing pixel values for the target image based on corresponding pixel value contributions from the base images selected in accordance with the motion classes assigned to the target image regions" yields a predictable result.

In accordance with Schultz's super-resolution image enhancement process: two successive low-resolution video frames are up-sampled to the high-resolution level and subpixel-

resolution motion vectors are estimated from the up-sampled frames (see section 3, first paragraph); the estimated subpixel-resolution motion vectors are down-sampled to obtain a single subpixel-resolution motion vector estimate for each pixel in the low-resolution video frames (see section 3, first paragraph); inaccurate motion estimates are detected and eliminated (see section 3.4); and the remaining subpixel-resolution motion vectors are used to determine the pixel values of the high-resolution video still image (see section 2). Paniconi discloses that the motion vectors are segmented into object classes and assembled into code vectors that are used to track objects across multiple video frames for the purpose of video compression (see col. 3, lines 54-65, and col. 1, lines 11-55).

Neither Schultz nor Paniconi nor the knowledge generally available at the time the invention was made provides any clues about how Paniconi's motion classification results might be incorporated into Schultz' super-resolution image enhancement process for the purpose of computing pixel values for the target image as proposed by the Examiner. In addition, neither Schultz nor Paniconi nor the knowledge generally available at the time the invention was made provides any reason to believe that Paniconi's motion classification results might be useful for the purpose of computing pixel values for the target image as proposed by the Examiner.

Furthermore, contrary to the Examiner's assertion, the proposed combination of Schultz and Paniconi does not involve "the predictable use of two known methods, one performed by the other, according to their established functions, to achieve their predictable results." Instead, the Examiner is attempting to change the use of Paniconi's object classes from a use in object tracking for the purpose of video compression to a use in computing pixel values for a target image based on corresponding pixel value contributions from the base images selected in accordance with those object classes. There is nothing predictable about such a change of use of Paniconi's method. Indeed, as explained above, neither Schultz nor Paniconi nor the knowledge generally available at the time the invention was made provides any clues about how Paniconi's motion classification results might be incorporated into Schultz' super-resolution image enhancement process for the purpose of computing pixel values for the target image as proposed by the Examiner. For example, Schultz does not disclose anything about motion classes and Paniconi does not disclose anything about using his motion classification results in determining base image pixel value contributions that are used to compute pixel values of a target image.

Thus, one skilled in the art at the time the invention was made would not have had any apparent reason to modify the teachings of Schultz in the manner proposed by the Examiner. For at least this additional reason, the rejection of independent claim 1 under 35 U.S.C. § 103(a) over Schultz in view of Paniconi should be withdrawn.

2. Dependent claim 3

Claim 3 depends from claim 1 and recites that assigning regions of the target image to motion classes comprises assigning pixels of the reference image to respective motion classes and up-projecting the motion class assignments to pixels of the target image.

In the Answer, the Examiner did not rebut Appellant's explanation that Paniconi does not disclose "up-projecting the motion class assignments to pixels of the target image" in col. 6, lines 1-24 (see § 2b on pages 18-19 of the Appeal Brief). Instead, the Examiner has simply argued that "Although the literal words of the dependent claims are not in the references, the scope of the claims that is defined by the words of the claims is in fact disclosed in the references as discussed in the rejections of the dependent claims" (see page 24, first full ¶).

The Examiner also has stated that "Schultz also discloses up-projecting on page 45 first column ("Up-sample both low-resolution frames)" (page 9, last full ¶ of the Answer). Although Schultz discloses "up-projecting", he does not disclose "up-projecting the motion class assignments to pixels of the target image," as recited in claim 3. Instead, Schultz simply discloses that two low-resolution frames are up-sampled. Indeed, as explained above, Schulz does not disclose or suggest anything about motion classes.

Thus, neither Schultz nor Paniconi discloses or suggests each and every element of claim 3. The rejection of claim 3 under 35 U.S.C. § 103(a) over Schultz in view of Paniconi should be withdrawn for at least this additional reason.

3. Dependent claim 11

Claim 11 depends from claim 1 and recites "computing an alignment accuracy map for each pairing of the reference image and a respective neighboring image based on the computed motion maps."

In the Answer, the Examiner did not rebut Appellant's explanation that Schultz does not disclose "computing an alignment accuracy map for each pairing of the reference image and a respective neighboring image based on the computed motion maps" on page 43 (see § 2c on page 19 of the Appeal Brief). Instead, the Examiner has simply argued that "Although the literal words of the dependent claims are not in the references, the scope of the claims that is defined by the words of the claims is in fact disclosed in the references as discussed in the rejections of the dependent claims" (see page 24, first full ¶). This reply does not rebut the explanation that the up-sampled frame disclosed on page 43 of Schultz does not constitute the reference image as defined in claim 11 (for example, the up-sampled image does not neighbor an image in a sequence of base images) and, therefore, the displaced frame difference along with its mean and variance do not constitute an alignment accuracy map for a pairing of the reference image and a respective neighboring image.

Without a proper rebuttal of Appellant's point, the Examiner has not shown that Schultz and Paniconi discloses or suggests each and every element of claim 11. Therefore, the rejection of claim 11 under 35 U.S.C. § 103(a) over Schultz in view of Paniconi should be withdrawn for at least this additional reason.

4. Dependent claim 16

Claim 16 depend from claim 1 and recites up-projecting the motion maps from the base image resolution level to the target image resolution level.

In the Answer, the Examiner did not rebut Appellant's explanation that Schultz does not disclose "up-projecting the motion maps from the base image resolution level to the target image resolution level" on page 45 (see § 2d on page 20 of the Appeal Brief). Instead, the Examiner has simply argued that "Although the literal words of the dependent claims are not in the references, the scope of the claims that is defined by the words of the claims is in fact disclosed in the references as discussed in the rejections of the dependent claims" (see page 24, first full ¶).

The Examiner also has stated that "Clearly the low resolution maps and motion vectors of the low resolution images in figures 1 and 2 are up-sampled to the resolution of the target image in order to generate the high resolution target image" (page 10, first ¶ of the Answer). Although Schultz discloses "up-projecting", he does not disclose "up-projecting the motion maps from the

base image resolution level to the target image resolution level," as recited in claim 16. Instead, the cited disclosure teaches that the low-resolution image frames themselves are upsampled and the motion vectors are determined from the up-sampled image frames (see page 45, numbered ¶¶ 1 and 2).

Thus, neither Schultz nor Paniconi discloses or suggests each and every element of claim 16. The rejection of claim 16 under 35 U.S.C. § 103(a) over Schultz in view of Paniconi should be withdrawn for at least this additional reason.

C. Rejection of claims 4, 5, and 44 under 35 U.S.C. § 103(a)

The Examiner has rejected claims 4, 5, and 44 under 35 U.S.C. § 103(a) over Schultz ("Subpixel Motion Estimation for Super-Resolution Image Sequence Enhancement") in view of Paniconi (U.S. 7,088,773) and Hanna (U.S. 6,269,175).

In the Answer, the Examiner did not rebut Appellant's argument that Hanna does not make-up for the failure of Schultz and Paniconi to disclose or suggest all the elements of any of the independent claims 1, 28, and 42. Therefore, claims 4, 5, 30, and 44 are patentable over Schultz, Paniconi, and Hanna for at least the same reasons explained above and in the Appeal Brief in connection with independent claims 1, 28, and 42.

In the Answer, the Examiner also did not rebut Appellant's explanation that Schultz in view of Paniconi and Hanna does not disclose each and every element of any of claims 4, 5, and 44 (see § VII.C on pages 21-22 of the Appeal Brief). Instead, the Examiner has simply argued that (see page 24, first full ¶):

> With respect to appellant's arguments for the dependent claims on pages 18-32 of the appeal brief, appellant merely asserts that the literal claim language is not found in the references, while ignoring the concept disclosed by the references. Although the literal words of the dependent claims are not in the references, the scope of the claims that is defined by the words of the claims is in fact disclosed in the references as discussed in the rejections of the dependent claims.

Without a proper rebuttal of Appellant's explanations, the Examiner has not shown that Schultz in view of Paniconi and Hanna discloses or suggests each and every element of any of

claims 4, 5, and 55. Therefore, the rejection of claims 4, 5, and 44 under 35 U.S.C. § 103(a) over Schultz in view of Paniconi and Hanna should be withdrawn for at least the additional reasons explained in the Appeal Brief in § VII.C on pages 21-22.

D. Rejection of claims 6, 12-15, 31, 33-36, 45, and 47-50 under 35 U.S.C. § 103(a)

1. Introduction

The Examiner has rejected claims 6, 12-15, 31, 33-36, 45, and 47-50 under 35 U.S.C. § 103(a) over Schultz ("Subpixel Motion Estimation for Super-Resolution Image Sequence Enhancement") in view of Paniconi (U.S. 7,088,773) and Eren ("Robust, Object-Based High-Resolution Image Reconstruction from Low-Resolution Video").

In the Answer, the Examiner did not rebut Appellant's argument that Eren does not make-up for the failure of Schultz and Paniconi to disclose or suggest all the elements of any of the independent claims 1, 28, and 42. Therefore, claims 6, 12-15, 31, 33-36, 45, and 47-50 are patentable over Schultz, Paniconi, and Eren for at least the same reasons explained above and in the Appeal Brief in connection with independent claims 1, 28, and 42.

2. Claims 6 and 13-15

In the Answer, the Examiner also did not rebut Appellant's explanation that Schultz in view of Paniconi and Eren does not disclose each and every element of any of claims 6 and 13-15 (see § VII.D on pages 22-24 of the Appeal Brief). Instead, the Examiner has simply argued that (see page 24, first full ¶):

> With respect to appellant's arguments for the dependent claims on pages 18-32 of the appeal brief, appellant merely asserts that the literal claim language is not found in the references, while ignoring the concept disclosed by the references. Although the literal words of the dependent claims are not in the references, the scope of the claims that is defined by the words of the claims is in fact disclosed in the references as discussed in the rejections of the dependent claims.

Without a proper rebuttal of Appellant's explanations, the Examiner has not shown that Schultz in view of Paniconi and Eren discloses or suggests each and every element of any of

claims 6 and 13-15. Therefore, the rejection of claims 6 and 13-15 under 35 U.S.C. § 103(a) over Schultz in view of Paniconi and Eren should be withdrawn for at least the additional reasons explained in the Appeal Brief in § VII.D on pages 22-24.

E. Rejection of claims 7-10, 18-27, 38-41, and 52-55 under 35 U.S.C. § 103(a)

1. Introduction

The Examiner has rejected claims 7-10, 18-27, 38-41, and 52-55 under 35 U.S.C. § 103(a) over Schultz ("Subpixel Motion Estimation for Super-Resolution Image Sequence Enhancement") in view of Paniconi (U.S. 7,088,773), Eren ("Robust, Object-Based High-Resolution Image Reconstruction from Low-Resolution Video"), and Kondo (U.S. 6,307,560).

In the Answer, the Examiner did not rebut Appellant's argument that neither Eren nor Kondo makes-up for the failure of Schultz and Paniconi to disclose or suggest all the elements of any of the independent claims 1, 28, and 42. Therefore, claims7-10, 18-27, 38-41, and 52-55 are patentable over Schultz, Paniconi, Eren, and Kondo for at least the same reasons explained above and in the Appeal Brief in connection with independent claims 1, 28, and 42.

2. Claims 7-10 and 18-27

In the Answer, the Examiner also did not rebut Appellant's explanation that Schultz in view of Paniconi, Eren, and Kondo does not disclose each and every element of any of claims 7-10 and 18-27 (see § VII.E on pages 24-32 of the Appeal Brief). Instead, the Examiner has simply argued that (see page 24, first full ¶):

> With respect to appellant's arguments for the dependent claims on pages 18-32 of the appeal brief, appellant merely asserts that the literal claim language is not found in the references, while ignoring the concept disclosed by the references. Although the literal words of the dependent claims are not in the references, the scope of the claims that is defined by the words of the claims is in fact disclosed in the references as discussed in the rejections of the dependent claims.

Without a proper rebuttal of Appellant's explanations, the Examiner has not shown that Schultz in view of Paniconi, Eren, and Kondo discloses or suggests each and every element of

any of claims 7-10 and 18-27. Therefore, the rejection of claims 7-10 and 18-27 under 35 U.S.C. § 103(a) over Schultz in view of Paniconi, Eren, and Kondo should be withdrawn for at least the additional reasons explained in the Appeal Brief in § VII.E on pages 24-32.

III. Conclusion

For the reasons explained above, all of the pending claims are now in condition for allowance and should be allowed.

Charge any excess fees or apply any credits to Deposit Account No. 08-2025.

Respectfully submitted,

Date: September 23, 2008

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